

DEPARTMENT OF THE ARMY
Wilmington District, Corps of Engineers
Post Office Box 1890
Wilmington, North Carolina 28402-1890

Action ID No. 200121094

May 1, 2002

PUBLIC NOTICE

The District Engineer has received a prospectus describing the establishment of a wetland compensatory mitigation bank for Federal and State permits as described below:

Bank Sponsor:

American Wetlands
11876 Sunrise Valley Drive, Suite 200
Reston, Virginia 20191

This public notice does not imply, on the parts of the Corps of Engineers or other agencies, either favorable or unfavorable opinion of the work to be performed, but it issued to solicit comments regarding the factors on which final decisions will be based.

The 99.81 acre mitigation bank is located on the east side of SR 1338 (Fisher Valley Road) adjacent to the west side of the Fisher River and is bounded on the south by an unnamed tributary of the Fisher River, in Bryan and Franklin Townships, approximately 5-6 miles northwest of Dobson, Surry County, North Carolina (see attached maps).

The bank sponsor proposes to establish, design, construct, and operate a wetland compensatory mitigation. The bank sponsor seeks to establish self-sustaining, functioning aquatic systems to replace functions and acreage of wetlands anticipated to be adversely affected by permitted activities. Specifically, the bank will focus on the restoration and creation of forested wetland habitats. The proposed project does not involve any work within existing waters and/or wetlands.

The Geographic Service Area (GSA) is the defined area wherein the Bank can reasonable be expected to provide appropriate compensation for impacts to wetland resources. The GSA for this Bank shall include the Yadkin hydrologic Unit (03040101) in Surry and Yadkin counties North Carolina. Use of a Bank Site to compensate for impacts beyond the GSA may be considered by the Corps or the permitting agency on a case-by-case basis. The enclosed map shows the approximate location of potential restoration, preservation and enhancement sites.

This mitigation bank may be considered one of a number of practicable alternatives available to applicants to compensate for unavoidable wetland impacts associated with permits issued under

the authority of Sections 404 and 401 of the Clean Water Act for projects located within the prescribed geographic service area.

Oversight of this wetland mitigation bank will be by a group of Federal and State agency representatives collectively referred to as the Mitigation Bank Review Team (MBRT). The MBRT shall be chaired by the Wilmington District, U.S. Army Corps of Engineers and is comprised of representatives from the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, N.C. Division of Water Quality, and the N.C. Wildlife Resources Commission.

The actual approval of the use of this mitigation bank for a specific project is the decision of the Corps of Engineers pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The Corps provides no guarantee that any particular individual or general permit will be granted authorization to use this wetland compensatory mitigation bank to compensate for unavoidable wetland impacts associated with a proposed permit, even though mitigation from this bank may be available.

A Public Notice regarding proposed mitigation banks is recommended pursuant to Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 Federal Register Number 228).

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate this proposed mitigation bank. In evaluating this proposal, the Corps will consider any comments received. Comments are used to assess impacts on endangered species, historic properties, conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards and flood plain values (in accordance with Executive Order 11988), land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

Preliminary review indicates that: 1) An environmental impact statement will not be required; 2) No species of fish, wildlife, or plant (or their critical habitat) listed as endangered or threatened under the Endangered Species Act of 1973 (PL 93-205) will be affected; and 3) No cultural or historic resources considered eligible or potentially eligible for listing on the National Register of Historic Places will be affected. Additional information may change any of these preliminary findings.

Written comments pertinent to the proposed work, as outlined above, will be received in this office, Attention: Mrs. Jean B. Manuele, Raleigh Regulatory Field Office, 6508 Falls of Neuse Road, Suite 120, Raleigh, North Carolina 27615, until 4:15 p.m., May 14, 2002, or telephone (919) 876-8441, Extension 24.

RECEIVED

APR 17 2002

RATION REGULATORY FIELD OFFICE

Prospectus

(revised 4-12-02)

Fisher River Wetland Mitigation Bank

American Wetlands
and
Soil & Environmental Consultants, PA

Fisher River Wetland Mitigation Bank

Prospectus (revised 4-12-02)

A. Administrative Provisions

The Fisher River Wetland Mitigation Bank is proposed as a Private-Commercial Bank, which will be operated as a Debit Bank and will offer wetland impact credits, primarily for wetland impacts by the North Carolina Department of Transportation in the upper Yadkin River basin (Cataloging Unit # 03040101). The property is currently owned by American Wetlands and Natural Resources Exchange Corporation (American Wetlands). The wetland mitigation effort will involve approximately 45.42 acres within a larger tract of about 99.81 acres.

Ownership will remain with American Wetlands during the minimum five-year monitoring and maintenance period at which time the intent will be to transfer title or easement to an acceptable land conservancy organization.

Discussions and meetings have been conducted with a number of resource agencies in the process of developing this prospectus. Representatives from the US Army Corps of Engineers (USACOE), USDA - Natural Resource Conservation Service, USDI - Fish and Wildlife Service, and NCDENR - Wildlife Resources Commission, and UNC - Greensboro have visited the site.

B. Technical Provisions

Location

The proposed Fisher River Wetland Mitigation Bank is located along the west side of Fisher River and is bounded on the south by an unnamed tributary (locally known as Big Branch) of the Fisher River, in Bryan and Franklin Townships, approximately 5-6 miles northwest of Dobson, North Carolina in Surry County. Fisher River is a tributary of the Yadkin River and is located in Sub-basin 02, Hydrologic Unit 2.

Land Use

The project area consists of a 99.81-acre tract that is currently being used for corn production to support a dairy operation. The land has been used for silage production by the former landowner since 1988, and prior to that was used also used for silage production as well as the growing of tulips, and earlier for tobacco production.

Records from the Natural Resources Conservation Service (NRCS), USDA, indicate the lands are classified as Prior Converted Wetlands, and this is supported by the ditch and tile systems which are currently in place. The natural community which existed prior to

development for agriculture was very likely Headwater Wetlands Forest. These systems will be more fully described later in the proposal.

There is currently a 100-foot wide deed restriction along and adjacent to the west side of Fisher River and a 50-foot corridor on both sides of Big Branch. This deed restriction precludes certain activities that would negatively impact riparian or wetland habitats. Activities by American Wetlands would enhance the intent of this restriction and would ensure that the protection would continue.

The Fisher River Wetlands Mitigation Bank is located in Surry County, Franklin Township. The land use in this portion of the County is primarily agricultural, with some rural, residential home sites located on the higher elevations on the drainage divides adjacent to State maintained roads. At the present time there is very limited development of any kind within the drainage. Limited growth is expected in the future. Most building sites are located in flood plains or wetland areas, and it would be difficult to find suitable septic drain fields. With the wetland bank being bounded by Fisher River on the east and Big Creek on the south, the banking site is protected from encroachments in the future. State Road 1338 bounds the property to the west and the previous owner of the wetland bank site has retained the 32-acre tract (not part of the bank) west of the road for his residence, and there are no plans for expanding any development. His dairy operation is being discontinued, thus eliminating potential impacts on the site. The landowner to the north plans to continue his agriculture operation of growing corn and has no plans for future development. He would probably be precluded from any other type of land use on his property because of poor drainage and wet conditions. Surry County does have county-wide zoning and the subject area is zoned "Rural Agriculture". Any changes from this land use would require a change in the zoning or an approved variance. The Wetlands Mitigation Bank is well protected in the future from outside influences.

Geomorphic Position

The site occupies a flood plain and broad fluvial terrace position of about 985' elevation. Soil parent material is fine-textured alluvium deposited by the Fisher River system from within the watershed. Elevation of the flood plain is about 6' - 8' above the base of the Fisher River channel. The fluvial terrace surface begins about 8' above the flood plain level (16' above the channel base). Topography is gently rolling in the first 500' from the river and in the southern portion of the site. The area in the central and northwest portion of the site is a nearly level to slightly concave large depression.

Soil Characteristics

Soils on the site are described in the following inventory:

Flood Plain

Colvard-Suches Complex

Well-drained, loamy, active to semiactive, mesic Fluventic Dystrudepts and Typic Udifluvents

Terrace (gently rolling)

Braddock Series

Well drained, fine, mixed, semiactive, mesic typic Hapludults

Dillard Series

Moderately well drained fine-loamy, mixed, semi-active, mesic Aquic Hapludults

Terrace (depressional area)

Hatboro Series

Poorly to very poorly drained fine-loamy, mixed, active, nonacid, mesic Typic Fluvaquents

The Hatboro Series is a Hydric Soil, comprises about 25.5 acres of the site, and represents the potential wetland restoration area. The NRCS has indicated that, to their knowledge, this is the largest single tract of hydric soils in Surry County. The Dillard Series is adjacent to the Hatboro Series and has included areas of somewhat poorly drained conditions, which represent potential wetland creation areas. Other potential creation sites exist within the Colvard-Suches Complex along the flood plain.

Site Hydrology

Drainage on the mitigation portion of the site is toward the east and northeast to the Fisher River. Runoff from a 74-acre watershed north and west of the site and precipitation provide input to groundwater on site. The depressional area of Hatboro soils had previously detained the majority of the water entering the system, resulting in wetland hydrology. The unnamed tributary (Big Branch) on the south end of the site drains a 1,085-acre watershed. The Fisher River which forms the eastern boundary of the site drains an approximate 23,000-acre watershed. Site flooding from the Fisher River is rare. Small natural tributaries of the Fisher River extend 300' to 500' into the site and ditches have been constructed across the site to facilitate the movement of ground and surface water to those natural channels. The result has been to partially drain the Hatboro soil area so that farming operations are feasible. Groundwater levels fall toward the Fisher River channel elevation, creating a "dry edge" effect in the terrace areas adjacent to the flood plain.

A water budget has been developed for the site which addresses inputs and outputs to and from the system.

The site will provide mitigation for impacts in Cataloging Unit #03040101 with the possibilities of negotiating to mitigate impacts in the adjoining Cataloging Units.

The actual watershed for the restoration site is relatively small (74 acres) and is dominantly undeveloped woodland and open pasture. There are approximately three residences within the watershed. Based on past trends and the age of existing housing in the watershed, it is not likely that significant changes will occur in the immediate watershed in the near future. The area is not under pressure for residential, commercial, or industrial development. In any event, changes in the immediate watershed would likely result in slightly higher runoff from impervious surfaces and the commensurate reduction in groundwater recharge and since all of the runoff would also be captured in the restoration area, it is not anticipated that it would negatively impact site hydrology.

Vegetation

The site is dominated by agricultural fields and is currently in a winter cover crop/corn silage rotation, except for shrub zones along the ditches (alder, etc.) and those areas along the Fisher River and small tributaries, which are wooded. The wooded areas represent a riparian corridor and contain some of the species which are proposed for the mitigation site (Yellow-Poplar, Sycamore, River Birch, Green Ash, etc.). Refer to the proposed planting scheme in the mitigation section. Natural vegetation of the area is typical of the transitional zone between mountain and piedmont systems.

Habitat

Existing site habitat is limited to; a) some minor cover areas along ditches for songbirds and small rodents, b) some open land feeding (e.g. mourning dove), and c) the wooded riparian corridor along the Fisher River which varies from about 50' to 200' in width and provides corridor habitat for deer, raccoon, opossum, fox, and a variety of birds, amphibians, and reptiles.

Except for the riparian corridor, there is little diversity on site. Habitat patches do not exist within the site, thus reducing the "edge effect". There is little connectivity within the site or to adjacent areas.

There is tremendous opportunity to create an ecologically "optimal" patch or patches as a result of the mitigation effort. By providing a contiguous core of wetland vegetation with diverse boundaries and vegetated "fingers" along the drains through the upland portion, the "edge effect" is enhanced and a network of connectivity is developed within and across the site.

Specifically, there is opportunity to create habitat for the Southern Bog Turtle (*Clemmys muhlenbergii*), a species that has been observed in Surry County and which is listed as threatened T(S/A) due to similar appearance to the Northern Bog Turtle. This habitat will be in the form of a shrub-bog created by developing depressional openings within the forested terrace and along the flood plain areas.

Proposed Mitigation Types

The intent of the mitigation effort is to develop a Palustrine Forested Wetland (Cowardin), further classified as Headwater Forest Wetland (NCDEHNR 1996 Field Guide Report No. 96-01), Piedmont-Mountain Bottomland Forest (Schafale & Weakley) with small areas of shrub-bogs interspersed. This will be done by restoring wetland hydrology to the hydric soil areas as well as developing wetland hydrology in the near-hydric areas. Two areas occur in fields along the flood plain which have opportunity for oxbow type shrub/marsh bogs. There are small wetland pockets within the flood plains of the Fisher River and Big Branch, which can be enhanced as part of the total mitigation effort. The reference area for this site is comprised of Piedmont-Mountain Bottomland forest and herbaceous bog types and is located approximately 2.6 miles southwest of the site in the Mitchell River valley. The Mitchell River valley is in the next watershed to the west of the Fisher River site. Additional information is provided below in the *Reference Site* section.

The following table lists the proposed wetland mitigation components (also see "Mitigation Types" map at the end of this report):

<i>Restoration</i>	<i>(1:1)</i>	<i>25.5 acres</i>	<i>25.50 credits</i>
<i>Creation</i>	<i>(3:1)</i>	<i>8.1 acres</i>	<i>2.70 credits</i>
<i>Enhancement</i>	<i>(2:1)</i>	<i>0.91 acres</i>	<i>0.45 credits</i>
<i>Preservation</i>	<i>(10:1 for One-side riparian buffer)</i>	<i>10.91 acres</i>	<i>1.09 credits</i>
<i>Total</i>		<i>45.42 acres</i>	<i>29.74 credits</i>

In assessing the potential ecological benefits of landscape restoration at the Fisher River Mitigation Site, consideration must be given not only to the actual wetland systems which will be developed, but also to the adjacent upland areas on site. It is important to consider the site as a part of the larger landscape and watershed. General landscape resources which are on, or adjacent to, the site include; Fisher River, Big Branch Creek, existing and former wetlands, and the remaining upland areas. The condition of the site affects water quality, habitat, and overall ecosystem health both on and off site. Restoration, creation, and enhancement of on-site wetlands is obviously the highest priority in this project inasmuch as the credits from that effort will help to offset wetland impacts elsewhere in the

watershed. Additionally, there is opportunity to preserve and restore the riparian buffers on upland areas adjacent to Fisher River and Big Branch. This will be accomplished by maintaining and enhancing existing vegetation within a minimum of 100 feet of the channel bank on the project side of the channel.

Reference Site

The reference area for the site is in a similar geomorphic position as the proposed mitigation site (flood plain and fluvial terrace) and is located approximately 2.6 miles southwest of the site in the Mitchell River valley (see accompanying map). The Mitchell River valley is in the next watershed to the west of the Fisher River site. The site has been visited by the USACOE and had been deemed to be acceptable pending approval by the MBRT.

The reference site is a smaller area of Hatboro Soils (hydric) similar to those at the mitigation site. The hydric soil unit is a long, narrow area parallel to the flood plain, at the base of a steep side slope. The site is between the upland side slope and the flood plain. The area is slightly lower in elevation than the adjacent flood plain. It is likely a portion of the old meander channel of the adjacent stream.

The reference site is also a Palustrine Forested Wetland (Cowardin), Headwater Forest Wetland (NCDEHNR 1996 Field Guide Report No. 96-01), and Piedmont-Mountain Bottomland Forest (Schafale & Weakley). The site appears to have been cleared at some point in the past but abandoned (probably due to excessive wetness). The plant community appears to be about 10-15 years old. Vegetation is dominantly Red Maple (*Acer rubrum*) and Tag Alder (*Alnus serrulata*) in the overstory and Hardhack (*Spirea tomentosa*), Silky willow (*Salix sericea*), Tearthumb (*Polygonum sagittatum*), and Microstegium (*Eulalia viminalis*) in the understory with some sphagnum moss (*Sphagnum* sp.) as groundcover in places.

Wetland hydrology at the site appears to be driven by groundwater from adjacent upland areas and up-gradient areas in the flood plain (a "seep"). The site has been saturated to within 12" of the surface during all site visits during the summer and fall of 2001. Three groundwater monitoring devices (see device specifications included) were installed at the site during mid-August, 2001. Initial download of data from mid-August through September, 2001 indicates that the site was saturated within 12" of the surface for about 75% of that period in two wells, and 100% of that period in the third. Observations of free water in auger borings in the adjacent flood plain and at the restoration site during those same periods indicated significantly drier conditions. It is apparent that the reference site has been, and will continue to be, wetter than the conditions at the restoration site. Level, arable land is a minor portion of the landscape in the foothill regions and is therefore in high demand as agricultural land. Nearly all of that type of land in the area has been drained and farmed in the past. Only those areas which are difficult to drain and farm were left out of production, such as these small seep areas which are saturated for a majority of the year. This presents a problem in finding a representative reference site and correlating reference site hydrology with a restoration site. This is true of the proposed

restoration site. It is likely that the original hydrology at the restoration site was not as wet as the reference site.

Data from the groundwater wells will be downloaded periodically and depths of saturation will be recorded during each quarterly visit. Well data will be verified by observation of water levels in hand dug auger holes at the time of data collection. This data will be presented, along with that from the mitigation site, to the MBRT in the annual report.

Implementation Methods

Hydrology - Grading

Restoration of wetland hydrology to the hydric soil area of the site will be accomplished by reversing the effect of the existing drainage system. There are four outlets from the ditch system in the hydric soil area to the Fisher River. Each ditch area has a change in slope at a point where it leaves the hydric soil area and traverses the better drained soil. These "nick points" coincide with the former heads of the natural drains to the river and are appropriate points to begin restoration of natural grade and drainage. Earth fill material will be placed to original grade at each of these points in order to; 1) fill the ditch cross section and 2) restore natural grade to areas adjacent to the ditch. There will be no structural outlet component with this re-grading effort (e.g. pipes, risers, etc.). The terminus of the filled ditches will be composed of rip-rap (large stone) material, crushed stone, fabric, and earth fill. The design is intended to withstand normal hydrologic and climatic conditions and is intended to require no maintenance. Long-term maintenance is not considered to be an issue, therefore no plans or funds are proposed for this purpose. Once the site has achieved success criteria it will be considered stable, relative to regional natural wetlands.

All existing ditches within the restoration site (except the one along the northern property line) will be filled to adjacent grade, except for short sections near State Road 1338 that tie in to the NCDOT right-of-way (so that water from NCDOT ditches will still drain from right-of-way). The fill will consist of earthen material removed from the wetland creation portions of the site.

At certain areas within the restoration, shallow depressions will be developed to create bog type conditions within the larger swamp forest. Diverse microtopography will be developed throughout the site as a result of the grading of the site. Rough grading of the site will result in depressions and hummocks which will add to habitat diversity and thereby enhance species diversity.

In the wetland creation of the project, wetland hydrology will be achieved by removing a portion of the overlying aerobic soil such that the layer where redoximorphic features indicate a seasonal high water table are within 12" of the surface. Additionally, shallow diversions will be developed on contour and the slope of the land surface will be flattened in those areas so that surface water will be detained for longer periods. Also, the drainage from the ditch along the northern portion of the site will be diverted to the

creation/restoration area since it is only about 1.0' deep and may be altered with limited effort and with no adverse effect to the adjacent property.

Two areas within the flood plain area will be graded to create bog type depressions where marsh and shrub bog species will be planted.

It is often useful to develop and analyze information relative to the dynamics of water in the natural system that is being altered. Ideally, that analysis would yield a conclusion that would indicate the desired hydrologic situation. In this case, the desired hydrologic conditions would support the target community of a Palustrine Forested Wetland and comprise at least jurisdictional hydrologic criteria. Unfortunately, a satisfactory model does not presently exist which absolutely predicts, in a natural system, the presence of saturated (within 12" of the land surface) or inundated conditions for the required consecutive number of days to create the desired wetland conditions. Controlled systems (structural inlet and outlet controls) are easier to model and predict than more natural systems. The plan for the Fisher River site does not rely on structural outlet controls.

Typically, a review of known input and output parameters is presented to indicate that a surplus of water could be available in the system during the growing season and therefore, saturated conditions would be possible. At this site, hydric soils are present within the alluvial deposits adjacent to Fisher River, indicating that reducing (hydric) conditions have been present in the past. The ditching of the site and testimony of local observers indicate that the wet conditions are contemporary and that, were it not for the present drainage system, seasonal saturated conditions would return. The hydric soils area is not subject to other than rare over-bank flooding from Fisher River.

The hydric soil area on site most closely fits the Ground Water Slope type of wetland (Novitzki 1979, 1989) which is amenable to wetland restoration. Carter (1986) discusses wetland water budgets in an often accepted formula:

$$P + SWI + GWI = ET + SWO + GWO + S$$

Where

P	= Precipitation
SWI	= Surface Water Inflow
GWI	= Ground Water Inflow
ET	= Evapotranspiration
SWO	= Surface Water Outflow
GWO	= Groundwater Outflow
S	= Change in storage

Based on this formula, a spreadsheet has been developed for monthly variations in the various system inputs and outputs and is included for reference. The following is a summary of data and assumptions relative to the variables in the formula above:

Precipitation (P)

Data for precipitation were taken from the Soil Survey for Forsyth County, NC and are presented as average monthly figures.

Surface Water Inflow (SWI)

Surface Water Inflow is estimated to be that portion which runs off from the adjacent 74.0-acre watershed. A conservative runoff coefficient ("c" factor) of 0.10 (10% of precipitation) is used. This is typical of forested conditions where little runoff is anticipated. Much of the watershed is in pasture, which would normally have a higher "c" factor of 0.30 (higher runoff). Conservative figures are being used for inputs to the system where actual data (e.g. precipitation) is not available. The data assumes 10% of the monthly rainfall on the 74.0-acre watershed runs off and is therefore available in the contiguous 33.6-acre restoration/creation portion of the site.

Ground Water Inflow (GWI)

Since there is no data relative to ground water inflow to the restoration site from the adjacent area, a conservative estimate is used here as well. It is reasonable to assume that a portion of the precipitation which infiltrates to ground water in the contributing watershed ultimately travels to the restoration site. Travel time and volume are not known, therefore a uniform rate of flow throughout the year is being used, based on 10% of annual precipitation in the watershed making it to the restoration area site via ground water. The contributing watershed is 74.0 acres. Total annual precipitation is 44.2 inches (4.42 inches represents 10% of the total). That total amount of input equates to 9.7 inches in the contiguous 33.6-acre restoration/creation portion, or 0.81 inches per month.

Evapotranspiration (ET)

PET data from NCSU Experiment Station Bulletin 396, "Weather and Climate in North Carolina" were used.

Surface Water Outflow (SWO)

Surface Water Outflow is estimated to be 10% of the monthly precipitation, based on a "c" factor of 0.10 for forested (target community) conditions. The remainder of the precipitation can be expected as input (above).

Ground Water Outflow (GWO)

Loss of water in the form of ground water outflow is estimated from soil drainage rates. This rate is approximately the saturated hydraulic conductivity of the least permeable layer within the rooting zone, or soil solium (approximately the upper four feet). This can be estimated by using 5% of the permeability of the least permeable layer within these upper horizons. The permeability of the least permeable horizon in this profile is estimated at 0.06 in/hr. Thus 5% of that figure adjusted for 28, 30, and 31-day months gives the drainage figure used as GWO.

Change in Storage (S)

This figure indicates excess or deficiency in the water regime on a monthly basis (does not account for cumulative effects of surplus water from prior months) . Excess water during the growing season, particularly in areas of hydric soils, implies that wetland hydrology is possible during that time.

Based on the data and the analysis as represented in the accompanying water balance spreadsheet, there is excess water in the system predicted in the months November through March. These figures show actual excess on a monthly basis and do not account for cumulative effects of excess water from the earlier months. It appears reasonable to assume that wetland (hydric, reducing) conditions exist in these months and through the latter part of March (early growing season), based on monthly data alone. However, with the potential cumulative effects of late winter surpluses, it is reasonable to assume that saturated conditions are possible several weeks in to the growing season.

Vegetation

The majority of the large area of hydric soil will be planted with seedlings of bottomland hardwood species in order to enhance the development of a Palustrine Forested Wetland (Cowardin), further classified as Headwater Forest Wetland (NCDEHNR 1996 Field Guide Report No. 96-01), Piedmont-Mountain Bottomland Forest (Schafale & Weakley). Many of the species proposed are hard mast producers which provides forage for several local species such as white-tail deer and turkey. Red maple, although a common local species, will not be planted in order to promote stand diversity. It is generally considered a moderately invasive species and will likely comprise a significant portion of the stand as a result of seed dispersal from adjacent sources.

Areas around the bog habitats will be planted with shrub species and marsh zones will be planted to herbaceous material or seeded with wetland seed mix. The species list below describes proposed typical species.

Once structural development and grading are complete, planting will begin during the next appropriate planting season for each type of vegetation (two-phased approach). Spring is preferred for the herbaceous material, with fall as a second preference. For the shrub and tree species, fall is preferred, with spring as an alternate.

Woody tree species will be planted on an 8' by 8' spacing. Woody shrub species will be planted on a 6' by 6' spacing. Herbaceous species will be planted on a 3' by 3' spacing or that area will be seeded with a wetland seed mix at 4 pounds per acre.

The following is a table of proposed species from which plant material will be selected:

Tree Species

Liriodendron tulipifera	Yellow-Poplar
Ulmus americana	American Elm

Celtis laevigata
Fraxinus pennsylvanica
Quercus phellos
Quercus nigra
Betula nigra
Platanus occidentalis
Acer negundo
Populus heterophylla

Sugar-Berry
 Green Ash
 Willow Oak
 Water Oak
 River Birch
 Sycamore
 Box-elder
 Swamp Cottonwood

Shrub Species

Rhododendron maximum
Cephalanthus occidentalis
Alnus serrulata
Salix discolor
Cornus amomum
Asimina triloba
Salix sericea

Rhododendron
 Buttonbush
 Smooth Alder
 Pussy Willow
 Silky Dogwood
 PawPaw
 Silky Willow

Herbaceous Species

Carex sp.
Juncus sp.
Osmunda cinnamomea
Osmunda regalis
 Other herbaceous species as available.

Sedges
 Rushes
 Cinnamon Fern
 Royal Fern

Upland areas of the site will be allowed to return to native vegetation through natural succession of plant communities. The areas will not be cut or harvested during the monitoring period, except as needed to provide path access to the wetland monitoring sites (for reading of wells and plant counts).

Success Criteria

Vegetation

The success of the vegetative component will be based on the survival of canopy tree species for a five-year monitoring period. Monitoring will occur for five years or until success criteria is met, whichever is longer. Transect lines, with permanent markers will be established in the field for vegetative monitoring (representative of community types). All monitoring will occur along these observation lines throughout the monitoring period as long as they continue to be representative of the community. Any changes to the observation points will require the approval of the MBRT. Vegetative success will be predicated on a minimum mean density of 260, five-year old stems per acre surviving after five years, all of which will be from the target species list (planted or native) or as that additionally approved by the MBRT. No single species shall comprise more than 20 % of

the surviving stems. By the end of the five-year monitoring period, vegetation in the proposed wetland areas must meet the criteria for hydrophytic vegetation as described in the 1987 Corps of Engineers Wetland Delineation Manual, specifically, more than 50% of the dominant species in all strata are OBI, FACW, or FAC as listed in "National List of Plant Species that Occur in Wetlands" - 1988 USF&W. The status of site vegetation, relative to this criteria, will be included in annual monitoring reports.

Hydrology

Hydrologic success criteria is somewhat problematic for two reasons; 1) there is little if any data (based on an extensive search of on-line sources, NC State University staff, other consultants, resources agencies) to establish hydroperiod specific to bottomland wetlands in the western Piedmont of North Carolina, and 2) the only available reference sites are typically wetter than the target wetlands since those areas were more difficult to bring into, and keep in, cultivation than those which were successfully drained for agricultural use. Typically, the references are those areas which were cleared at one time and were ultimately abandoned due to wetness problems.

Although the consultants would like to base hydrologic success criteria on some known data from the target community, there appears to be inadequate data on which to base the criteria. Given this situation, and the fact that the impacts for which this mitigation is proposed are based on hydrologic criteria as described in the "Corps of Engineers Wetlands Manual", January, 1987 (Manual), the proposed criteria for hydrologic success is that described in the 1987 manual. The Manual states that "duration of inundation and/or soil saturation during the growing season is more influential on the plant community than frequency of inundation/saturation during the growing season." Table 5 in the Manual outlines Hydrologic Zones in Nontidal Areas. The bottom limit for duration of saturation/inundation in wetlands in that table is 5% of the growing season. Generally, any duration of saturation/inundation above 12.5% of the growing season is considered to have wetland hydrology.

Since data are not available for the target community, the mid-point in the 5% - 12.5% range, or 8.75% of the growing season, is proposed as criteria for hydrologic success at this site. Growing season may be estimated as the average number of frost-free days. An estimate for Surry County is based on the average of climatic data presented in the soil survey documents from adjacent counties (Alleghany and Yadkin). The average number of frost-free days in Alleghany is 155 and in Yadkin is 202, therefore, since this site is topographically between those areas, an average of 178 days is chosen for this criteria. Given that, 8.75% of the growing season is 15.575 or 16 days. Saturation to within 12 inches of the surface for 16 or more contiguous days during the growing season in any year will be considered successful hydrology for that year. Saturation of less than 16 contiguous days during a growing season will be reviewed and considered by the MBRT relative to any abnormal climatic or environmental conditions.

Phasing

It is most efficient to do all construction (structural and grading) in a single phase since all outlets and ditches need to be blocked to effectively restore the entire area. Also, the

material needed for the filling of ditches and dam construction will be obtained from the graded areas in the creation portion.

Each area of the site with common plant types should be planted in one operation so that desired habitat type may be encouraged and invasive species are minimized. The planting may be done in phases by plant types (e.g. Phase I -all woody material planted in late Fall or Winter; Phase II – all herbaceous material planted in Spring).

Potential Scheduling (example)

Project Begins	February,	2001
Detailed Site Survey (topography)	April,	2001
Concept Plan and Prospectus	June,	2001
Development of MBRT (preliminary)	August,	2001
Site Meeting with Agencies	Aug - Sept,	2001
Detailed Mitigation Plan	October,	2001
Develop MBI	November,	2001
Plan Approval by USCOE/NCDWQ	January,	2002
Contractor Selection	February,	2002
Construction Begins*	March 1,	2002
Grading and Structural Complete	May 31,	2002
Install Monitoring Devices/Monitoring Begins	August, 2002 / June 2002	
Planting Begins (Phase I)	June 1,	2002
Planting Complete (Phase II)	January,	2003
Monitoring Phase	1/03 through 12/08	

Construction Supervision will include:

- 1) Pre-construction/planting meeting with contractor.
- 2) Site supervision during installation.
- 3) Final inspection after all site work is complete, preparation of appropriate completion of work statement, preparation of as-built report and plan, and documentary photos and submission of that report to the MBRT for review within 30 days of completion.
- 4) Flagging of the mitigation site limits in the field, delineating between different treatment areas.

C. Operations Provisions

Service Area

The primary service area is the upper Yadkin River area (cataloging unit #03040101) with the possibility of negotiating the mitigation of impacts in adjoining cataloging units. The primary service area is in the northwestern Piedmont and foothills of North Carolina and includes portions of municipalities such as Winston-Salem, Yadkinville, Mount Airy, and North Wilkesboro, NC. Use of the bank for projects outside the primary service area may be proposed and considered on a case-by-case basis.

Wetland Types (debit)

The bank will supply credits for impacts to Bottomland Hardwood Forest and Mountain Bog wetland types. Wetland and stream impacts are common in this service area relative to road building, large retail and industrial site development, and watershed/water supply development.

Credit Release

Fifteen percent (15%) of the Bank's total credits shall be available for sale immediately upon completion of all of the following:

- a. Execution of this MBI by the Sponsor, the Corps, and other agencies eligible for membership in the MBRT who choose to execute this agreement;
- b. Approval of the final Mitigation Plan;
- c. Delivery of the financial assurance described in paragraph 25 of this MBI;
- d. Recordation of the preservation mechanism described in paragraph 24 of this MBI, as well as a title opinion covering the property acceptable to the Corps;

Additionally, the Sponsor must complete the initial physical and biological improvements to the bank site pursuant to the Mitigation Plan no later than the first full growing season following initial debiting of the Bank.

Subject to the Sponsor's continued satisfactory completion of all required success criteria and monitoring, additional mitigation credits will be available for sale by the Sponsor on the following schedule:

10% after first year,	if interim success measures are met	(25% of total)
10% after second year,	if interim success measures are met	(35% of total)
10% after third year,	if interim success measures are met	(45% of total)
15% after fourth year,	if interim success measures are met	(60% of total)

15% after fifth year,	if interim success measures are met	(75% of total)
or		
25% after fifth year once overall success criteria has been met		(100% of total)

The above schedule applies only to the extent the Sponsor documents acceptable survival and growth of planted vegetation, attainment of acceptable wetland hydrology as described under the success criteria in the monitoring section of the mitigation plan. The final 25% of credits will be available for sale only upon a determination by the MBRT of functional success as defined in the mitigation plan.

Following the five-year monitoring period, the MBRT will meet to discuss final approval of the bank. The portion of the credit release schedule which is based on the end of the first, second, etc. successful year begins after all initial construction/restoration activities are complete. Some construction activities, relative to site repair, may follow during the five-year monitoring period.

Monitoring

The project site and reference sites will be monitored for a period of at least five years (or until all success criteria are met) following initial construction of the project. This will involve observation of two basic parameters in the wetland areas; 1) vegetation and 2) hydrology.

Vegetative conditions will be evaluated relative to the number and type of living stems of canopy tree species and the wetland occurrence status of all plant community strata at standard sampling points within each restoration or creation unit.

Site hydrology will be evaluated during site visits as well. Groundwater monitoring devices have been installed throughout the restoration and proposed creation areas, as approved by the USACOE (see accompanying map), which will continually record (at least daily) and store data on water levels. These will be capacitance-type instruments, the data from which can be downloaded in the field (see example specifications sheet from Remote Data Systems, Inc. included). Daily water level data can be determined and presented for review. Any areas to be inundated, will be monitored with water depth indicators (graduated poles). Data from the groundwater wells will be downloaded periodically and depths of saturation and inundation will be recorded during each quarterly visit. Well data will be verified by observation of water levels in hand dug auger holes at the time of data collection. This data will be presented to the MBRT in the annual report.

Site visits will be conducted quarterly by a Professional Soil Scientist or Biologist. These visits will be made at the end of each season (around March 1, June 1, September 1, and December 1). An annual report of conditions will be made to the MBRT at the end of each calendar year. This report will summarize observations from the quarterly visits. Visits may occur more often as needed (e.g. following severe weather conditions, etc.). Any damage or other site conditions which may jeopardize the long-term success of the project will be addressed as observed during the monitoring period. The conditions will be described, along with proposed solution, in a report to the MBRT as soon as possible.

The monitoring phase will begin at the start of site preparation, be carried out by the contractor, continue for a minimum of five (5) years or until success criteria are met and will include:

- 1) Preparation of as-built plans and report describing completed conditions and any modifications or variances from the original mitigation plan. This information will be prepared and submitted within 30 days of completion of site construction/planting and will include a detailed topographic survey by a Registered Land Surveyor, particularly in areas where grading or other modification to the land surface has occurred.
- 2) Quarterly inspections of vegetation from standard observation points including, early, mid, and late growing seasons. Site vegetation conditions along with documentary photos, will be summarized in the formal report for that calendar year (to be submitted within 30 days of the end of the year). Should the mid growing season site inspection indicate conditions which need to be corrected, this will be reported in a brief letter to the MBRT, along with the suggested remediation. This will allow time to obtain plant material and repair and re-plant the failed areas during that following winter or spring.
- 3) Quarterly inspections of the site to record elevation of inundation and saturation. Each site visit will document hydrologic conditions, including documentary photos. Data for each year will be submitted to the MBRT in the annual formal report, within 30 days following each calendar year. Should any significant change or damage occur on the site (e.g. as a result of severe weather) during the year, this will be reported as soon as possible, in order to develop a repair and restoration plan.
- 4) Monitoring present and future threats to the success of the plan, including any degrading factors such as depredation, trespassing, vandalism, or plant removal from destructive wildlife, domestic animals, and humans. If a potentially project threatening problem is observed, a contingency plan to rectify the problem will be submitted to the MBRT.

Contingency Planning

A contingency plan will be developed as part of the preparation of the Mitigation Banking Instrument. Prior to release of credits, American Wetlands shall provide evidence of financial assurances for completion of construction, monitoring, and reporting to the USACOH. The financial assurance will be based on the cost of doing the mitigation work. Such work includes, but is not limited to; maintenance of hydrology monitoring devices, sediment and erosion control, grading, planting, undesirable species control, depredation control, human impact control, as-built surveys, and five-year monitoring. Grading estimates include a 20% re-grading contingency and the planting plan prescribes twice the required density of species required to meet the performance standard for survival of desired species. Should there be any additional needs for grading or planting, such needs will be provided for from the maintenance and monitoring funds being held by NCDOT.

Work already complete includes; purchase of land, boundary survey, topographic survey, purchase of monitoring devices, Phase I Environmental Site Analysis, Archaeological and Architectural review, Threatened and Endangered Species field surveys and file research, and preliminary grading and planting plans.

Financial Guarantees

1. American Wetlands has provided NCDOT, and executed, a Promissory Note and an executed and recorded first lien Deed of Trust on the property in the amount of Five Hundred and Sixty Six Thousand and Eight Hundred and no/100 Dollars (\$566,800.00). The Deed of Trust was recorded upon the closing of the purchase of the property on April 30, 2001.
2. Construction and Payment Bonds in the amount of Four Hundred and Fifty Thousand and no/100 Dollars (\$450,000.00) have been secured to cover the grading and planting costs, which have been estimated to be significantly less than this amount.
3. American Wetlands will require grading and planting contractors to provide additional performance and payment bonds in the amount of the actual costs of performing such work. This requirement of sub-contractors is required by American Wetlands' bonding company.
4. Monitoring, reporting, and any necessary maintenance will be paid from funds held by NCDOT for such purposes. These funds will be paid to American Wetlands after notification to NCDOT and the USACOE that all monitoring and maintenance work for the year has been accomplished, and NCDOT's approval of such monitoring and maintenance activities. This is a contractual requirement between American Wetlands and NCDOT.
5. American Wetlands has general liability insurance in the amount of \$1,000,000 for each occurrence, \$2,000,000 for the second occurrence, and \$1,000,000 environmental coverage. In addition, American Wetlands carries \$1,000,000 Directors/Officers insurance.
6. Also see Appendix F. of MBI.

GRAPHIC SCALE
1" = 4000'

4000 0 4000 8000

N
1:25,000

MITIGATION SITE

Vicinity Map

Surry County, NC

Fisher River Mitigation Bank

American Wetlands & Soil and Environmental Consultants, PA

1991

Orthophoto - "Bottom, NC"

Scale 1" = 400'

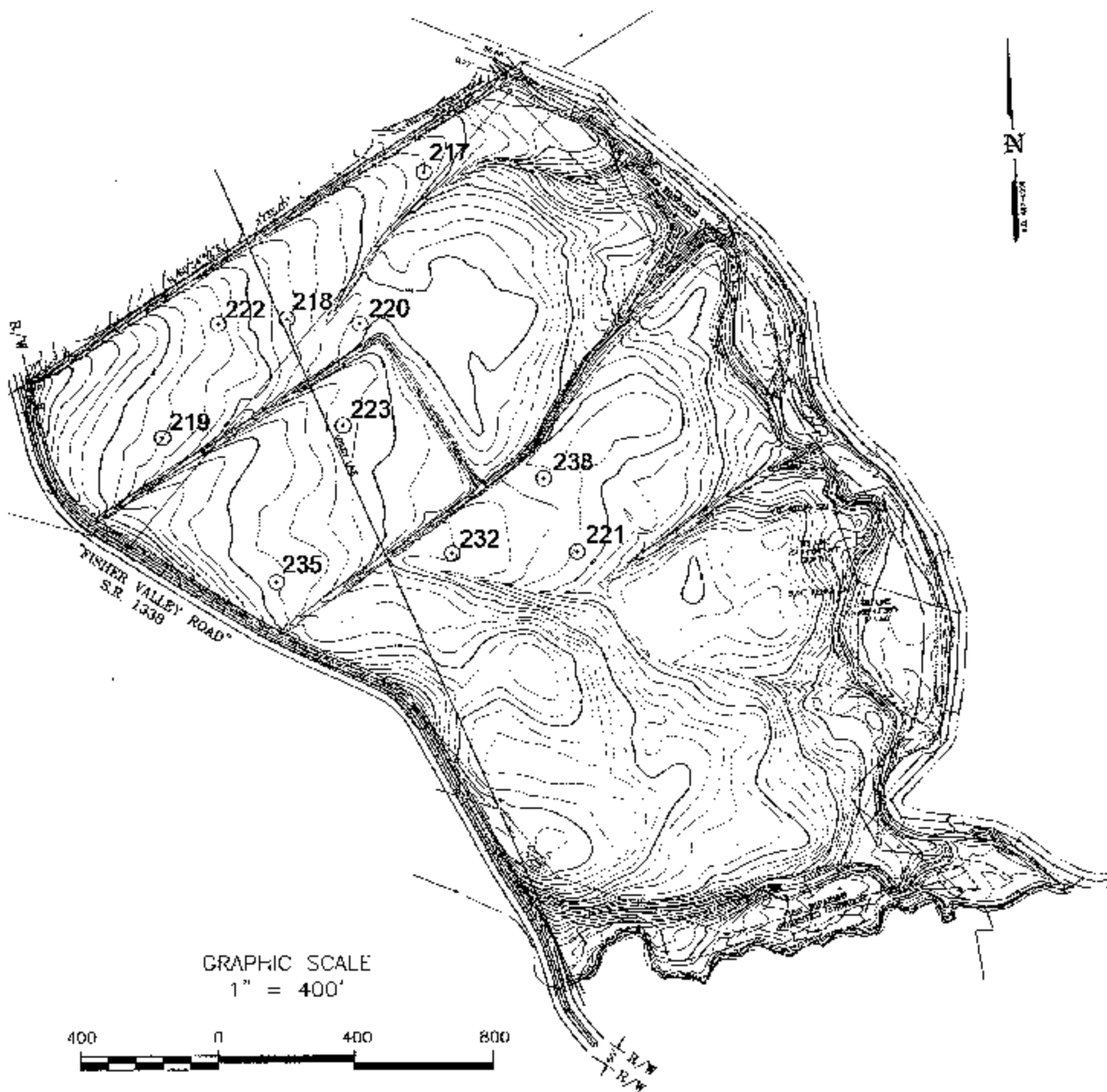
Fisher River Mitigation Bank

Antecore Wetlands & Soil and Environmental Consultants, PA

MITIGATION SITE

GRAPHIC SCALE
400'



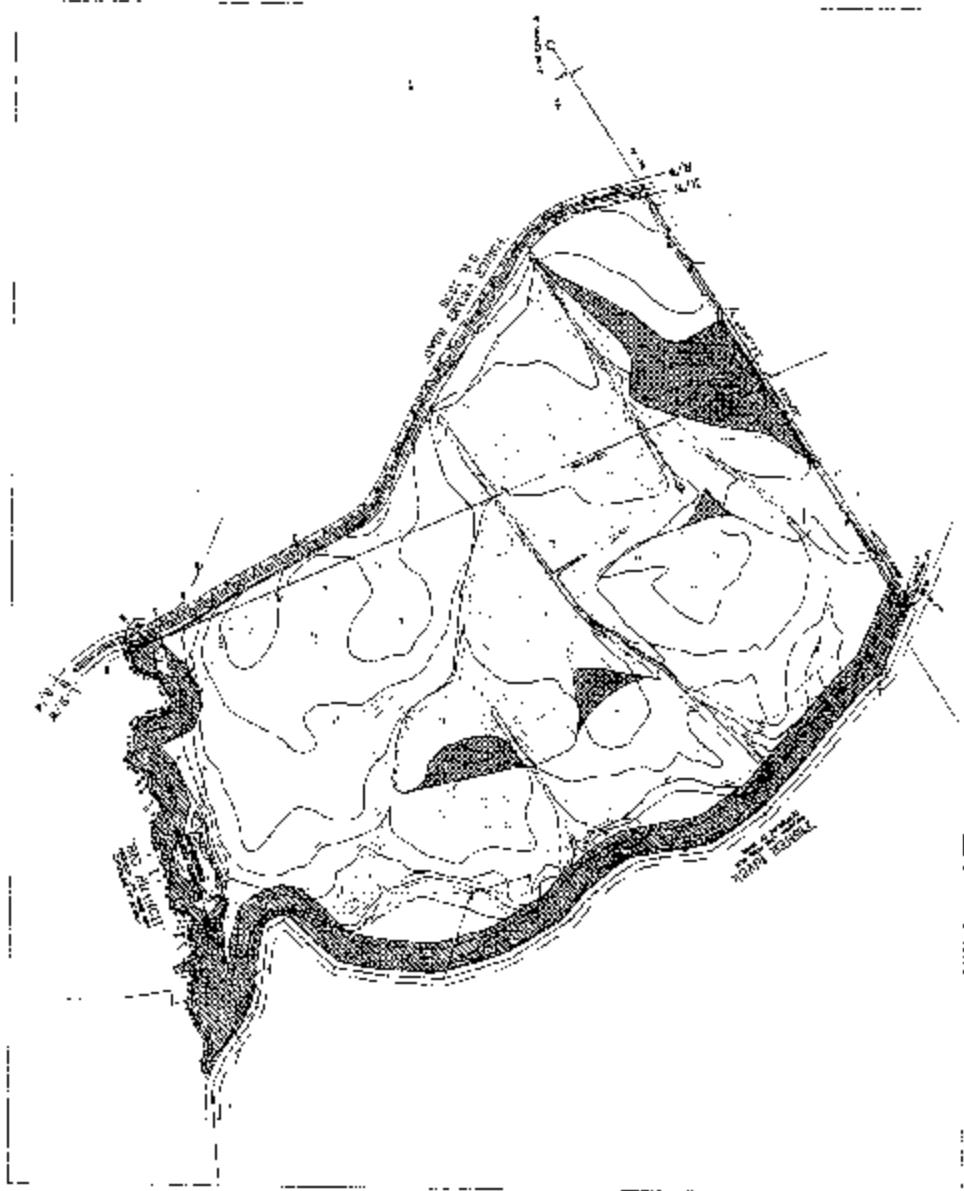


Monitoring Wells Locations

Scale: 1" = 400'

Fisher River Mitigation Bank

American Wetlands & Soil and Environmental Consultants, PA



MITIGATION TYPES

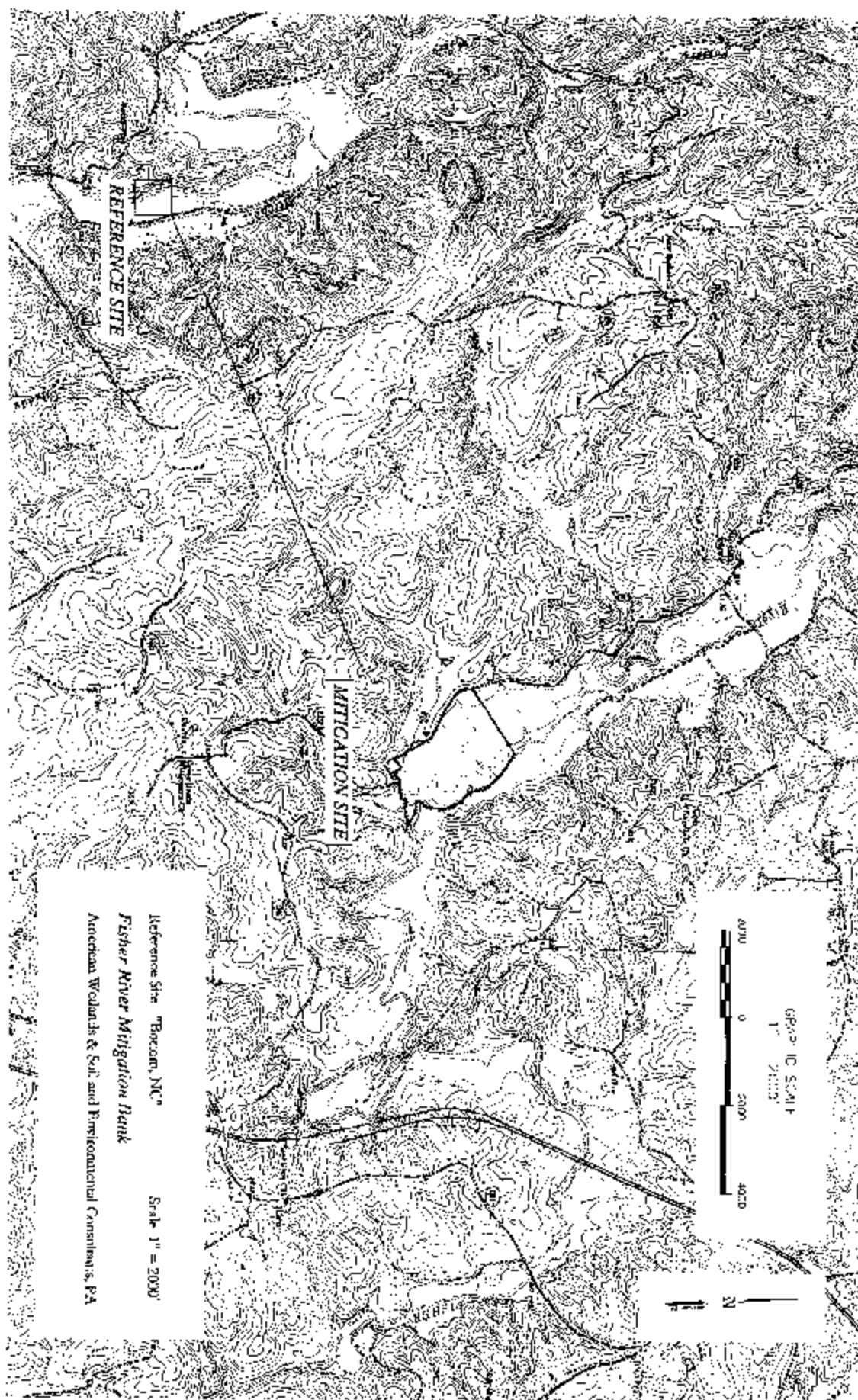
- WETLAND RESTORATION AREA
25.5 ACRES
- WETLAND CREATION AREA
8.10 ACRES
- WETLAND ENHANCEMENT AREA
0.91 ACRES
- 100' RIPARIAN BUFFER
10.91 ACRES



Soil & Environmental Consultants, PA
 11010 Seven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-6900 • Fax: (919) 846-0457
www.Seed.Com

AMERICAN WETLANDS
 FISHER CREEK MITIGATION TYPES
 SURRY COUNTY
 MARCH 2002

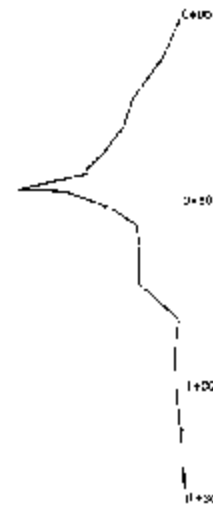
JCD NO.
 C102
 PROJECT # PC-11-002
 SO
 12/04/02
 LAL
 THE
 MITIGATION
 TYPES



CROSS SECTION #2



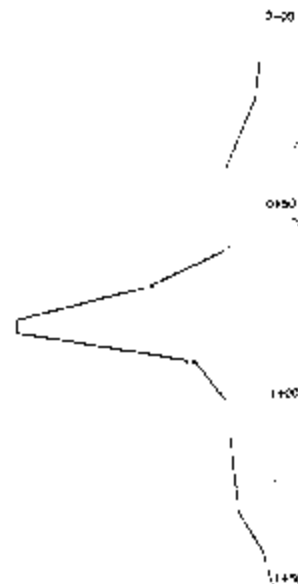
CROSS SECTION #1



CROSS SECTION #4



CROSS SECTION #3

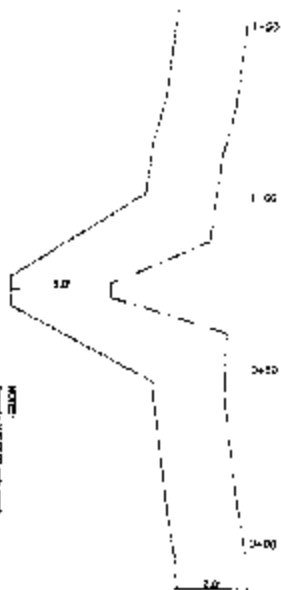


ARTIFICIAL WETLANDS
TICHER CREEK CROSS SECTIONS 1-4
RIVER-CO, INC.
JANUARY 2002

S&EC

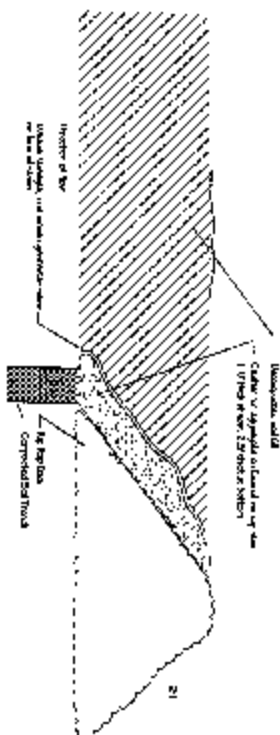
Soil & Environmental Consultants, PA
11510 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5966 • Fax: (919) 846-4467
www.sandec.com

202 INCH
6 INCH
PROJECT NAME
CLIENT
LOCATION
DATE
FIELD WORK
DATE
BY: JAMES L. WATKINS, III
PROJECT NUMBER: 11-0006



1 CROSS SECTION - TRENCH

NOTE:
Trench to be filled with compacted material to a depth of 1.0 ft. The material to be compacted shall be the same as the material used in the construction of the dam.



2 PROFILE SECTION OF STONE DAMS IN EXISTING DITCHES, TYP

Construction - Temporary

Temporary construction is a major project. The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

Notes

1) A pre-construction conference will be conducted on site prior to construction of equipment.

2) The project will be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

a) The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

b) The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

3) The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

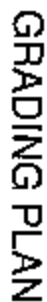
4) The project is to be completed in a timely manner. The project is to be completed in a timely manner. The project is to be completed in a timely manner.

SOIL & ENVIRONMENTAL CONSULTANTS, P.A.
2110 River Edge Road - Suite 200, Westborough, MA 01581
Phone: (508) 366-1921 • Fax: (508) 366-0464
www.seec.com

SOIL & ENVIRONMENTAL CONSULTANTS, P.A.
2110 River Edge Road - Suite 200, Westborough, MA 01581
Phone: (508) 366-1921 • Fax: (508) 366-0464
www.seec.com

SOIL & ENVIRONMENTAL CONSULTANTS, P.A.

SOIL & ENVIRONMENTAL CONSULTANTS, P.A.
2110 River Edge Road - Suite 200, Westborough, MA 01581
Phone: (508) 366-1921 • Fax: (508) 366-0464
www.seec.com



AMERICAN WETLANDS
FISHER CREEK GRADING PLAN
SULLY COUNTY
JANUARY 2002

**S&
EC**

Soil & Environmental Consultants, PA

17010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 348-1900 • Fax: (919) 448-2457
www.SandPC.com

CW 610
 C-621
 PROJECT # 7015 MK-6
 MD
 DR/Rev
 NSI MAY
 NLS
 SDC/MLC 6/24/94
 E 076942350
 1 21712065